Notice of Allowability	Application No.	Applicant(s)	
	10/073,423	BHASKAR ET AL.	
	Examiner	Art Unit	
	ABUL K. AZAD	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the communication filed on February 13, 2002*.

2. ☒ The allowed claim(s) is/are *1-4 and 6-22*.

3. ☒ The drawings filed on *13 February 2002* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 8/15/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

A.K. AZAD 2/10/05

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Craig Plastrik (Reg. No. 41,254) on February 8, 2005.

The application has been amended as follows:

IN THE CLAIM:

Please amend claim 1 as follows:

1. A frequency domain interpolative CODEC system for low bit rate coding of speech, comprising:

a linear prediction (LP) front end adapted to process an input signal providing LP parameters which are quantized and encoded over predetermined intervals and used to compute a LP residual signal;

an open loop pitch estimator adapted to process said LP residual signal, a pitch quantizer, and a pitch interpolator and provide a pitch contour within the predetermined intervals; and

a signal processor responsive to said LP residual signal and the pitch contour and adapted to perform the following:

provide a voicing measure, said voicing measure characterizing a degree of voicing of said input speech signal and is derived from several input parameters that are correlated to degrees of periodicity of the signal over the predetermined intervals;

extract a prototype waveform (PW) from the LP residual and the open loop pitch contour for a number of equal sub-intervals within the predetermined intervals;

normalize the PW by a gain value of said PW;

encode a magnitude of said PW; and

reconstruct a nonstationarity component of a PW phase at a decoder every subinterval using only a received PW magnitude, a stationary component of said PW, said voicing measure, a PW subband nonstationarity measure and a pitch frequency contour information;

wherein a ratio is computed comparing the ratio of the energy of the nonstationarity component of the PW to that of the stationary component of the PW which is averaged over five PW subbands.

Claim 5 has been canceled.

Please amend claim 6 as follows:

Claim 6, line 1, change "5" to - -1- -

Please amend claim 14, as follows:

14. A frequency domain interpolative CODEC system for low bit rate coding of speech, comprising:

a linear prediction (LP) front end adapted to process an input signal providing LP parameters which are quantized and encoded over predetermined intervals and used to compute a LP residual signal;

an open loop pitch estimator adapted to process said LP residual signal, a pitch quantizer, and a pitch interpolator and provide a pitch contour within the predetermined intervals;

a signal processor responsive to said LP residual signal and the pitch contour and adapted to perform the following:

provide a voicing measure, said voicing measure characterizing a degree of voicing of said input speech signal and is derived from several input parameters that are correlated to degrees of periodicity of the signal over the predetermined intervals;

extract a prototype waveform (PW) from the LP residual and the open loop pitch contour for a number of equal sub-intervals within the predetermined intervals;

normalize the PW by a gain value of said PW;

encode a magnitude of said PW; and

reconstruct a nonstationarity component of a PW phase at a decoder every subinterval using only a received PW magnitude, a stationary component of said PW, said voicing measure, a PW subband nonstationarity measure and a pitch frequency contour information;

wherein a ratio is computed comparing the ratio of the energy of the nonstationarity component of the PW to that of the stationary component of the PW which is averaged over five PW subbands.

Allowable Subject Matter

2. Claims 1-4 and 6-22 are allowed over the prior art of record.

3. The following is an examiner's statement of reasons for allowance:

As per independent claims 1 and 14, the applicant teaches, a frequency domain interpolative codec system for low bit rate coding of speech. The prior art of record fails to teach or fairly suggest the claimed combinations of features. Particularly prior art of record fails to teach or fairly suggest in combination with other limitations, a ratio is computed comparing the ratio of the energy of the nonstationarity component of the PW to that of the stationary component of the PW which is averaged over five PW subbands. Therefore, claims 1-4 and 6-22 are allowed over the prior art of record.

As per prior art of record, for example Choy teaches, am amplitude quantization scheme for low-bit-rate speech coders includes the first step of extracting a vector of spectral information from a frame. The energy of the vector is normalized to generate gain factors. The gain factors are differentially quantized. The normalized gain factors are non-uniformly downsampled to generate a fixed-dimension vector with elements associated with a set of non-uniform frequency bands. The fixed-dimension vectors are differentially quantized. However, Choy fails to teach or fairly suggest, a ratio is computed comparing the ratio of the energy of the nonstationarity component of the PW

to that of the stationary component of the PW which is averaged over five PW subbands.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-3838.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richemond Dorvil**, can be reached at **(703) 305-9645.**

Any response to this action should be mailed to:

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Or faxed to:

(703) 872-9314

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center's Customer Service Office at telephone number **(703) 306-0377.**

Abul K. Azad

February 10, 2005